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ABSTRACT

This study used several measures to compare 40 toddlers with delays in expressive language and 40 children acquiring language normally. Findings indicated that children with small expressive vocabularies at 2 years of age are not different from their normally speaking peers in terms of hearing, history of ear infections, birth order, or pre- or peri-natal history. They do tend to come from families with a history of language or learning disorders. In addition, children with small expressive vocabularies: (1) appear to have subtle deficits in nonverbal problem solving despite having normal intelligence; (2) are very likely to show deficits in social maturity; (3) seem somewhat less motivated than normally speaking children to interact with others; (4) are perceived by their parents as being hyperactive and more difficult to manage than normal toddlers; and (5) show less phonological skill, in terms of syllable structures produced and number of different consonants used. Preliminary outcome data suggest that children with small vocabularies at 2 years of age are at moderate risk for language delay that continues until at least 3 years of age. They are at somewhat higher risk of articulation deficit at age 3. Social immaturity persists to this age. (RH)

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PROFILES OF TODDLERS WITH DELAYED EXPRESSIVE LANGUAGE DEVELOPMENT

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TABLE 1
ASSESSMENT INSTRUMENTS: BASELINE EVALUATIONS (AGE 2)

Areas Assessed	Instrument	Reference
Hearing level	Visually reinforced audiometry	
Adaptive behavior (receptive and expressive communication, daily living skills, socialization, motor skills)	Vineland Adaptive Behavior Scales	Sparrow, S., Balla, D. & Ciccetti, D. (1984)., Circle Pines, MN: AGS.
Personality/temperament	Childhood Personality Scale	Cohen, D. (1975). Washington, DC: NIMH
Developmental level	Bayley Scales of Infant Development - Mental Scale	Bayley, N. (1969). N.Y.: Psych. Corp.
Nonverbal cognitive level	Uzgiris-Hunt Scales of Infant Psychological Development	Dunst, C. (1980). A Clinical and Educational Manual for Use with the Uzgiris-Hunt Scales of Infant Development. Baltimore: University Park Press.
Expressive vocabulary size	Parent questionnaire (see Appendix)	Rescorla, L. (1984) Language at 2. Poster session, American Academy of Child Psychiatry, Boston, MA.
Receptive language	Reynell Developmental Language Scale-Receptive	Reynell, J. (1984). London: NFER Nelson.
Oral-motor structure and function	Observational protocol	Paul, R. (1987). A model for assessing communication disorders in infants and toddlers. NSSLHA Journal, 15, 88-105.
Communicative intentions expressed	Analysis of video-taped mother-child interactions	Paul, R. & Shiffer, M. (1987). An examination of communicative intention in speech-delayed toddlers. Paper presented at ASHA convention, New Orleans,LA.
Phonological patterns	Analysis of video-taped mother-child interactions	Olswang, L., Stoel-Gammon, Coggins, T., & Carpenter, R. (1987). Assessing Linguistic Behaviors. Seattle: University of Washington Press.
Mother's interaction style	Analysis of video-taped mother-child interactions	Adapted from Boudurant, J., Romeo, D. & Kretschmer, R. (1983). Language behaviors of mothers of children with normal and delayed language. LSHSS, 14, 233-242

TYPE ABSTRACT HERE—BE SURE TO STAY WITHIN BORDER

PROFILES OF TODDLERS WITH DELAYED EXPRESSIVE LANGUAGE

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This study compares 36 toddlers with delays in expressive language with 42 children acquiring language normally. Assignment to group was made on the basis of parental report of vocabulary on an expressive language checklist. Groups were matched on age, sex ratio, and SES. There were no significant group differences in birth order, reported number of ear infections, or history of prenatal or perinatal difficulties. However, the delayed group was nearly three times as likely to have a family history of language delay.

The delayed group obtained significantly lower scores in Vineland Adaptive Behavior and significantly higher scores in Maladaptive Behavior than the normal group. Additional data from the Vineland Adaptive Behavior Scales indicated that the normal group expressed communicative intent, either verbally or nonverbally, significantly more often than the delayed subjects. While both groups scored within the normal range on the Bayley Mental Development Scale, the normal group's mean MDI was significantly higher, and it performed significantly better on the Language Comprehension scale of the Reynell Developmental Language Scale. Thus, children selected as "late bloomers" on the basis of parent report on an expressive language questionnaire appeared to be at significant risk for later language deficits.

SUBMITTER'S NAME: Rhea Paul

KEY WORDS: language delay , speech delay , slow-talkers

Profiles of Toddlers with Delayed Expressive Language Development

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Paper presented at the 1989 Society for Research in Child Development
Biennial Meeting

One of the most puzzling problems confronting clinicians is the child who, at age two, appears normal in every way, but fails to begin talking. While it is well-known that children with learning disabilities frequently have histories of slow language growth, and that older preschoolers with delayed language tend to have chronic deficits, very little is known about the prognosis for two year olds with delayed onset of language. Traditional wisdom counseled a "wait and see" attitude and parents are still frequently told that their two year old will grow out of the delay. While, no doubt, this spontaneous improvement does frequently occur, there are some two year olds for whom early expressive delay presages long term difficulty in language and school achievement. The problem for clinicians is to decide which two year old with slow speech development can confidently be left alone to outgrow the problem, and which should be monitored closely or provided with some form of intervention.

SLIDE 1

The data presented here form the basis of an attempt to resolve this dilemma. Children between 18 and 34 months of age whose parents reported small expressive vocabulaires on the Language Development Survey (Rescorla, in press) comprised the Expressive Language Delay (ELD) group. Criteria for ELD were selected to identify the bottom tenth percentile of the normal distribution of language acquisition. So children were considered

delayed if they produced fewer than ten intelligibile words at 18-23 months, or fewer than 50 words or no two word combinations by 24-34 months. Forty children who met these criteria were recruited from local pediatric practices and media announcements. A group of normally speaking toddlers was matched to the ELDs on the basis of age, sex ratio, socioeconomic status, and race. (See Table/slide 1.) All the subjects were given an intensive battery of assessments for hearing, receptive language, cognitive development, oral motor function, and adaptive behavior. Parents also filled out questionnaires regarding demographic information, medical history and child behavior. A videotaped free play interaction between parent and child was analyzed for maternal linguistic input, child comunicative behavior, and child phonological characteristics. Today I will present information from these baseline assessments, in order to draw a portrait of the ELD toddler. I will also present some preliminary findings of the first follow-up of this sample at age three. (See Table/Slide 2.) My intention is to follow this cohort to early school age to look at outcomes in terms of language and school achievement, and to look for predictor variables at age two that discriminate outcomes at age six. In this way, we will have firmer ground on which to make decisions about ELD toddlers we see in the future.

In order to determine, first, whether the ELD group were really different from that of normal toddlers, a discriminant function analysis using the data collected at the baseline evaluation was run. It showed, first, that **all** of the delayed children would have been correctly classified and 96% of the normals would have been correctly assigned, using the data gathered at the assessments. The factors that were important in making these assignments were sex, SES, receptive language level, socialization level, as tested on the Vineland Adaptive Behavior Scales (Sparrow, Balla, & Ciccetti,

1984) and family history of language problems. The factors that did not contribute much to the assignments were number of ear infections, Bayley IQ, overall frequency of intentional communication, and maladaptive behaviors listed by parents on the Childhood Personality Scale (Cohen, 1975). I'll talk more about these factors in a few minutes, but the point here is that the two groups were quite distinct by this analysis.

I'd like to show now how the two groups compared on some of the demographic and historical data we collected. Table/slide 3 presents demographic data on the sample. The groups clearly differ in the expressive vocabulary size reported by parents; with an average of 195 words for the normals and 31 for the ELD. These data suggest that the groups are closely matched in terms of age, SES level, racial composition, and sex ratio. Not surprisingly, a large majority of the ELD sample is male. (The normal sample was matched to the delayed groups on this basis.) Also, it can be seen that there is no significant difference in terms of birth order. While popular lore, and many of parents themselves, tend to blame ELD on the fact that these children are later-borns, in fact there were as many first borns in the delayed sample as there were in the normal group, which was not intentionally matched on this factor.

Table/slide 4 shows the hearing level on audiological testing and number of ear infection reported by parents for the delayed and normal groups. It can be seen that there are no differences in hearing acuity (anything between 0 and 15dB HL is considered normal, with lower levels representeing greater acuity). Number of ear infections reported by parents also did not differentiate the groups. Although this is a very rough estimate of history of otitis media, the fact that both groups report similar figures suggests that OM is very common in all children under two and does not, as

the discriminant function anaysis suggested it did not, contribute strongly to explaining ELD at this age. It may be the case that if frequent bouts of OM continue after age two, an effect on language development is seen.

Table/slide 5 reports medical history, showing that neither pre- nor peri-natal problems reported by parents distinguished the groups. One factor that does differ is the reported incidence of history of language, speech or learning problems in other family members. This history was reported 3-4 times more frequently in the delayed group, indicating a possible genetic basis for at least some cases of the disorder.

Table/slide 6 shows the results of the Bayley Scale of Infant Mental Development (1969). Both groups are clearly in the normal range, but the normal group did score significantly higher, with a mean DQ of 122. While it might appear that the normal group is performing at a superior, rather than average, level of intellectual development, recent data on the Bayley suggest that it does tend to produce inflated scores in normal children. Thus the scores in the normal group may be spuriously high. Nonetheless, the fact is that there is a significant difference in favor of the normals on this measure. Because many of the Bayley items require comprehension or expression of verbal material, it was possible that the difference between the two groups was attributable to a specific deficit on the part of the ELD group on performance on the verbal items. An item analysis was done to address this question.

All the children tested passed all the items on the Bayley up to and including item #123. It turns out that the last forty items on the test (#123-163) are equally distributed between verbal and nonverbal. There are ten items that require expressive language, such as naming objects, naming pictures and producing sentences; ten that require responses based on

understanding language such as discriminating objects, pointing to pictures, and understanding prepositions; and twenty that do not require language at all such as building a tower, imitating crayon strokes, and completing puzzles. This convenient arrangement allowed a comparison to be made on the proportion of the last 20 verbal items vs. the proportion of the last 20 nonverbal passed by the subjects in the two groups. The analysis revealed, first and not surprisingly, that the normal group passed a significantly higher proportion of the receptive items, the expressive items, as well as the combination of both types of verbal items. However, the normal group also passed significantly more of the last twenty nonverbal items. While the difference between the groups on the verbal items was greater than that on the nonverbal, both differences were significant. It would seem, then, the ELD children, while generally performing within the normal range of cognitive development, may be evidencing subtle deficits in even nonverbal forms of problem solving, and I think my colleague, Dr. Thal, will comment further on what some of these deficits might be.

Table/slide 7 shows the performance of the two groups on the Vineland Adaptive Behavior Scales. It can be seen that the groups did not differ on the Daily Living scale, consisting primarily of self-help skills, or on the Motor scale, which assesses gross and fine motor development. There were, however, significant differences in expressive language, receptive language and socialization.The expressive communication scale was used to validate the subjects' group assignments based on the LDS. Examining performance on the expressive communication scale revealed that all the subjects classified on the LDS as delayed, except for two, scored more than six months below age level on the Vineland expressive scale, and the other two scored five months below age level on this scale. All the subjects

classified as normal on the LDS, except for one, scored within six months of age level or better on the Vineland expressive and receptive scales, and that one scored eight months below age level on the expressive scale but within the normal range on the receptive scale. Thus the LDS seems, as Rescorla (in press) reports, to be a valid indicator of language status in this age group.

The difference between the groups in terms of receptive level was examined further to look for subgroups within the ELD sample, based in receptive language skill. While the ELD group did perform more poorly on the average than the normals, 70% of the ELD toddlers scored within six months of age level on this scale. Only 30% of the delayed sample, then, appear to show deficits on the receptive scale concomitant with their expressive delays. This 30% of the sample may be at greater risk for chronic deficits than the children with problems restricted to expressive communication.

The significant difference between the groups in terms of socialization skill on the Vineland was also explored for subgroup placement. Here the results show that 90% of the ELD toddlers scored more than six months below age level, while none of the normal groups did so. Because some of the items on the socialization scale required verbalization, such as saying "please" or addressing people by name, an item analysis to determine the influence of verbal performance on this scale was carried out. Results indicated that the normal subjects passed a significantly higher percentage of verbal items than did the ELD children, as would be expected. Normal subjects also passed a significantly greater absolute number of nonverbal items, suggesting that the poor performance of the ELD children on the socialization scale went beyond an inability to engage in verbal social routines. Fifty-nine percent of the ELD subjects showed deficits in expression

and socialization only, while an additional 31% were low in expression, socialization and comprehension of language.

This difficulty in social behavior persisted in the follow-up data, as well. Of the children who continued to show deficits in language performance at age three (41% of the delayed sample), 73% also showed deficits in socialization skill. In addition, of the children who went from ELD at age two to normal in terms of language performance at age three, 11% continued to show poor performance on socialization even when the language delay had resolved.

These data suggest that social skill deficits are highly correlated with ELD, and the fact that social skill deficits persist even in children who outgrow their language delays could be interpreted to indicate that socialization problems may form part of the basis of the ELD. That is, the slowness in language growth and the poor socialization may both related to an underlying decrement in motivation to interact. These children may be experience somewhat less drive for interaction than other toddlers, which results in less need to acquire language, even when the potential to do so exists.

This hypothesis is supported, to some extent, by the data on expression of communicative intentions, as well. Table/slide 8 gives the coding scheme used for analyzing expression of communicative intentions in the ten minute free play mother/child interactions we videotaped. As Table 9 shows, the ELD group produced significantly fewer communicative initiations, including nonverbal gestures and vocalizations, than did the normal children. While ELD children expressed all the types of intentions that were expressed by the normal children, their overall frequency of communicative initiation was lower. However, the difference in frequency

could primarily be accounted for by a difference in one particular type of communicative intention: the comment or joint attentional intention, used to focus the mother's attention on an object or activity. Commenting was the most frequent intention for both groups, but the normals used it significantly more often than the ELD group did. Thus the difference between the groups in terms of expression of communicative intentions was a quantitative one, and limited to the intention primarily concerned with interaction for its own sake, rather than for the attainment of environmental ends. Again, the ELD group looks as if it is somewhat less interested in interacting with others, even nonverbally.

In terms of behavior, the two groups were compared on the Childhood Personality Scale, a parent questionnaire. The items on this scale were divided into four groups: hyperactivity, conduct, relationships to others, and affect/mood. (See Table/slide 10.) Here significant differences were found between the two groups on the hyperactivity and conduct scales only. In addition, parents were asked to complete a questionnaire which listed a series of possible "problem behaviors" and to rate the presence of these problems in their child on a scale of "not at all," "some problem," or "serious problem". The ELD group was rated as showing significantly more problem behaviors on this instrument than the normal group. The ELD toddlers, then, seem to be perceived by their parents as overly active and harder to manage than normal two year olds. While studies of older langauge impaired children (Paul & Cohen, 1984) do show high incidences of hyperactivity in this population, conduct disorders are not usually identified as a problem area for older langauge disordered children (Baker et al., 1980). The perception of conduct problems on the part of the parents of these ELD toddlers may be due to the ordinary "terrible two" phenomenon that is

combined in these children with their poor ability to get their messages across, which may lead to increased frutration, and temper tantrums. In addition, some of the children with poor receptive skills may be perceived as noncompliant. Children at this age often use strategies for comprehending language that result in the appearance of more comprehension than is present when nonlinguistic cues are removed (Chapman, 1977), and the ELD toddlers may make use of these same strategies to appear to understand much of what is said to them in context. When they fail to comply because of poor comprehension of more complex or less context-supported language, this failure may be attributed to negativism.

Next I'd like to present some data on phonological behavior. We looked at syllable structure characteristics of the subjects' productions in both vocalizations and meaningful words, using an adaptation of Stoel-Gammon's (1987a) procedure. Table/slide 11 gives the coding criteria for this procedure, which scores vocal production at three levels. Level I includes vowels, syllablic consonants and CV syllables containing only glottal stops or glides; Level II includes utterances with CV, VC, or CVC syllables with a single consonant type; Level III includes syllables with more than one consonant type. Table/slide 12 presents preliminary results based on an analysis of 12 subjects in each of the two groups. In terms of use of syllable structures, the normal group was significantly more advanced, with a mean syllable structure level of 2.33, as opposed to the ELD group's 1.66. We also looked at the percent consonants correctly produced in meaningful words by the two groups. Here you can see that the normals produced 68% correct, with corresponds very closely to the value of 70% that Stoel-Gammon (1987b) found. The PCC for the ELD group was 51%, but this was not a significant difference. There was a significant difference, though, in the

number of different consonant types produced by the two groups, with the normals producing an average of 16 different consonants, while the ELD group's average was only 8. It seems clear that ELD toddlers are showing less maturity in phonological production than their peers with normal expressive vocabulary size.

This difference in phonological skill also persisted in the follow-up data. Fifty-six percent of the delayed sample showed problems in articulation performance, falling below the 10th percentile on the Goldman Fristoe Test of Articulation(1969), at age three. Of the delayed children who continued to show expressive language deficits at age three (41% of the delayed sample), 64% also had articulation problems. And fifty percent of those originally in the ELD group who moved into the normal range in terms of expressive language at age three nontheless scored below the tenth percentile in terms of articulatory performance.

To sum up, it appears that children with small expressive vocabularies at age two are not different from their normally speaking peers in terms of hearing, history of ear infections, birth order or pre- or peri-natal history. They do tend to come from families with a history of language or learning disorders. In addition, they appear to have subtle deficits in nonverbal problem solving despite IQs within the normal range, they are very likely to show deficits in social maturity and seem somewhat less motivated to interact with others, as indexed by their decrement in frequency of expression of communicative functions concerned with joint attention. They are perceived by their parents as hyperactive and more difficult to manage than normal toddlers, and show less phonological skill in terms of syllable structures produced and number of different consonants used.

Preliminary outcome data (Chart 1) suggests that children with small vocabularies at age two are at moderate risk for language delay that continues to at least age three, with 41% of the sample showing this pattern. They are, in addition, at a somehat higher risk of articulation deficit at age three, with 56% of the total sample showing poor articulation (Chart 2). Social immaturity persisits to this age in 41% of the total sample, including 11% who have moved into the normal range of language performance (Chart 3). These data suggest that there is cause for concern when a two year old fails to show the expected growth in expressive vocabulary, and that a substantial portion of this population will not have"outgrown" the delay by age three. Identifying which delayed toddler has the greatest risk for long-term deficit, and what intervention strategies will be most effective in ameliorating outcome are the tasks that are still ahead.

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Table 2.
Assessment Instruments: Age Three

Area Assessed	Instrument	Reference
Receptive vocabulary	Peabody Picture Vocabulary Test-R	Dunn, L. & Dunn, L. (1981) Circle Pines, MN: American Guidance Service.
Expressive vocabulary	Expressive One-Word Picture Vocabulary Test	Gardiner, M. (1981). Novato, CA: Academic Therapy Publications.
Receptive morphology and syntax	Test of Auditory Comprehension of Language	Carrow-Woolfolk, E. (1985). Allen, TX: DLM Teaching Resources
Expressive syntax and morphology	Developmental Sentence Score (from audiotaped conversational sample)	Lee, L. (1974). Developmental Sentence Analysis. Evanston, IL: Northwestern University Press.
	Mean length of utterance in morphemes and sentence structure analysis (from audiotaped conversational sample)	Miller, J. (1981). Assessing Language Production in Children. Baltimore: University Park Press.
Articulatory maturity	Goldman-Fristoe Test of Articulation	Goldman, R. & Fristoe, M. (1969). Circle Pines, MN: American Guidance Service.
Intelligibility	Observational rating of free speech sample	Shriberg, L. & Kwiatkowski, (1981). Phonological disorders I. JSHD, 47, 226-241.
Developmental level	Draw-a-Person Test	Goodenough, H. & Harris, D. N.Y.: Harcourt, Brace, & Javonovich, 1963.
Adaptive behavior	Vineland Adaptive Behavior Scales	Sparrow, Balla, & Ciccetti, op. cit.

TABLE 3

DEMOGRAPHIC CHARACTERISTICS

	NORMAL	DELAYED	SIGNIFICANT DIFFERENCE BETWEEN GROUPS?
Mean expressive vocabulary size reported on Language Development Survey (Rescorla, in press)	195	31	YES
Mean age (and s.d.) in months at time of first evaluation	25.4 (4.6)	25.2 (4.0)	NO
Proportion of males	69%	76%	NO
Proportion of first-borns	40%	36%	NO
Mean (and s.d.) SES	2.5 (1.4)	2.9 (0.9)	NO
Proportion of subjects from nonwhite racial groups	17%	0%	YES
Porportion of subjects for whom English is only language spoken in home	100%	97%	NO

TABLE 4
HEARING STATUS

	NORMAL	DELAYED	SIGNIFICANT DIFFERENCE BETWEEN GROUPS?
Pass hearing screening at 25 dB	100%	100%	NO
Mean number (and s.d.) of ear infections in first two years of life (parent report)	4.3 (4.9)	5.7 (5.5)	NO

TABLE 5
MEDICAL HISTORY

	NORMAL	DELAYED	SIGNIFICANT DIFFERENCE BETWEEN GROUPS?
Proportion of parents reporting prenatal complications	31%	18%	NO
Proportion of parents reporting perinatal complications	53%	44%	NO
Proportion of parents reporting family history of language delay	14%	41%	YES

TABLE 6

BAYLEY SCALES OF INFANT DEVELOPMENT RESULTS

	NORMAL	DELAYED	SIGNIFICANT DIFFERENCE BETWEEN GROUPS?
Mean score (and s.d.) on Bayley Scales of Infant Development-Mental Scale	116.3 (17.6)	97.7 (16.6)	p< .0001
Mean proportion of all language items passed	88.5	78.0	p< .0001
Mean proportion of expressive language items passed	92.0	47.0	p< .0001
Mean proportion of receptive language items passed	86.0	69.0	p< .003
Mean proportion of nonverbal items passed	89.0	78.0	p< .02

TABLE 7

MEANS (and S.D.s) OF VINELAND ADAPTIVE BEHAVIOR SCALE AGE EQUIVALENT SCORES

	NORMAL	DELAYED	SIGNIFICANT DIFFERENCE BETWEEN GROUPS?
Receptive Communication	34.5 (11.1)	25.1 (8.4)	$p < .01$
Expressive Communication	28.1 (8.5)	14.6 (2.7)	$p < .01$
Socialization	24.1 (5.0)	17.4 (2.3)	$p < .01$
Daily Living	23.3 (4.9)	20.6 (2.8)	none
Motor	23.6 (4.3)	21.3 (3.1)	none

TABLE 8

CODING SCHEME FOR COMMUNICATIVE INTENTIONS

(Based on Wetherby, Cain, Yonclas, & Walker, 1988)

REGULATORY INTENTIONS
request action
request object
protest

SOCIAL INTERACTIONAL INTENTIONS
request social routine
greeting
calling
request permission
acknowledgement

JOINT ATTENTIONAL INTENTIONS
comment
request information
request clarification

TABLE 9
MEANS (and S.D.s) OF FREQUENCY OF USE OF COMMUNICATIVE INTENTION TYPES IN TEN MINUTE FREE PLAY INTERACTION

	TOTAL FREQUENCY	REGULATORY	SOCIAL INTERACTION	JOINT ATTENTION
DELAYED	27.5 (11.2)	7.4 (5.4)	1.1 (1.3)	19.0 (9.7)
NORMAL	51.1 (15.8)	3.5 (2.8)	3.2 (4.0)	45.3 (15.0)

TABLE 10
MEAN SCORES (and S.D.s) ON FOUR SUBSCALES OF THE CHILDHOOD PERSONALITY SCALE

	HYPERACTIVITY	RELATIONSHIPS	CONDUCT	MOOD
DELAYED	30.3 (9.20)	8.7 (5.9)	7.7 (5.3)	2.2 (1.4)
NORMAL	23.4 (9.3)	6.1 (4.7)	5.1 (3.2)	1.4 (1.0)

TABLE 11

SCHEME FOR CODING SYLLABLE STRUCTURE LEVEL

(Adapted from Stoel-Gammon, 1987)

Score 1: utterances consisting of voiced vowel(s), syllabic consonants, or CV syllable(s) with only glottal stops or glides as consonants.

Examples: /wawa/, /n/, /i/.

Score 2: utterances consisting of CV, VC, or CVC syllable(s) in which only one consonant type appears (disregard voicing differences).

Examples: /gigi/, /dada/, /tɛdi/.

Score 3: utterances consisting of syllables with two or more different consonants.

Examples: /cʌp/, /apa/, /dali/.

TABLE 12

MEANS (and S.D.s) OF PHONOLOGICAL MEASURES IN TEN MINUTE FREE PLAY SAMPLES

	NORMAL	DELAYED	SIGNIFICANT DIFFERENCE
SYLLABLE STRUCTURE LEVEL	2.33 (0.25)	1.66 (0.42)	P< .0005
PERCENT TARGET CONSONANTS CORRECT	68.2 (14.9)	50.7 (26.5)	none
NUMBER OF DIFFERENT CONSONANT TYPES PRODUCED	16.7 (3.0)	8.3 (5.2)	p< .0005

Chart 1: Proportion of Subjects Showing Language Delay at Age 3

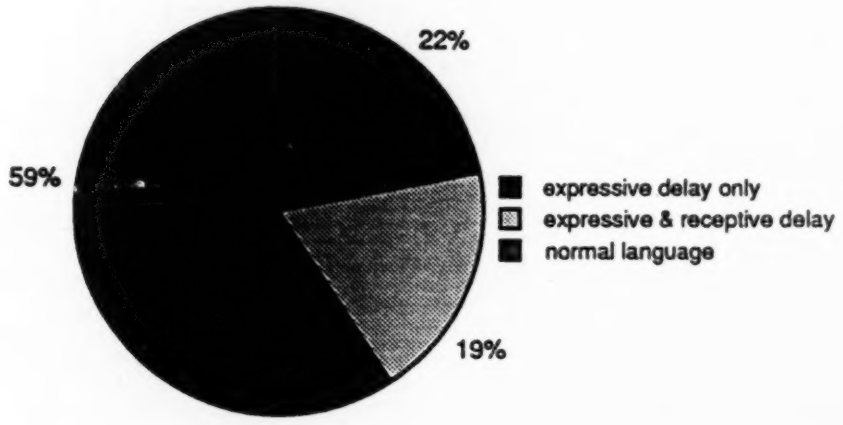

Chart 2: Proportion of Subjects Showing Articulation Delay of Age 3

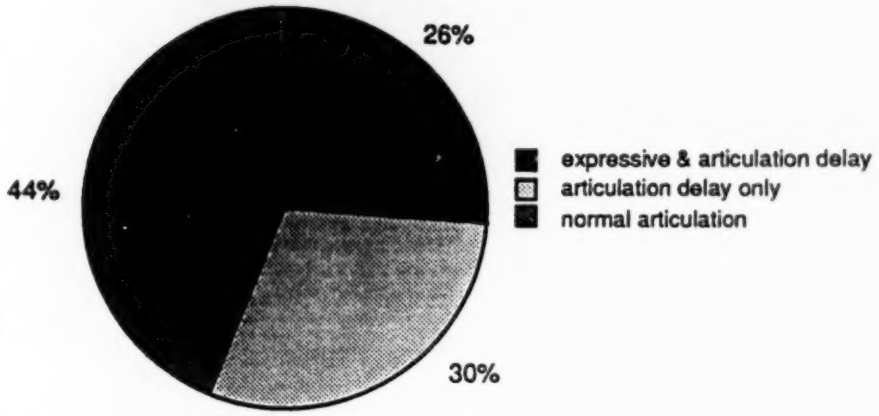

Chart 3: Proportion of Subjects Showing Socialization Deficit at Age 3